REMARKS

By the foregoing Amendment, Claims 1, 5, 14-16, 25 and 28 are amended, Claims 2-4,11-13, and 29 are cancelled and additional Claims 30 and 31 are presented. The outstanding Office Action has been carefully considered and the set of claims has been amended in order to respond to each and every one of the Examiner's rejections set forth therein. Entry of the Amendment, and favorable consideration thereof is earnestly requested.

A) Amendment to the claims

Independent claims 1 and 28 have been amended to better define the invention. More specifically, these claims have been amended to clearly define the fragments of coconut mesocarp consisting in a mixture of parenchyma bound-up to mesocarp fibers and the biofilter material has been limited to the biofiltering of water. These amended claims are believed to be patentably distinguishable from the prior art cited by the Examiner, as will be more fully discussed hereinafter.

Claims 4 and 13 having been cancelled, the dependency of claims 5 and 14-16 has been changed to now respectively depend on claims 1 and 10. Claim 25 has been amended to correct a typographical error.

Claims 30-31 have been added in order to cover a preferred feature of the invention.

B) Response to the claim rejections under 35 USC §102(f)

The Examiner states that the applicant did not invent the claimed subject matter because fragments of coconut mesocarp is allegedly a naturally occurring substance. Although the applicant agrees about the fact that coconut mesocarp, as such, is a naturally occurring substance, he respectfully disagrees about the

fact that fragments of mesocarp exist naturally. The applicant submits that bringing the mesocarp into fragments is an act of mankind and not a naturally occurring act; and using the coconut mesocarp as a biofilter material is even more an act of mankind. However, and only to better bring out this fact, new claim 1 has been amended to recite that the biofilter material comprises a mass of fragments of coconut mesocarp. The applicant respectfully submits that amended claim 1 clearly satisfies 35 USC 102(f) and the Examiner is kindly requested to withdraw that rejection.

C) Response to the claim rejection for lack of novelty in view of the prior art cited

The Examiner has rejected all the claims as being anticipated in view of either one of the following references: US 5,264,129 (Simpson); US 5458662 (Toyone); US 6,696,284 (Harridas); DE 4415 963; US 6,620,321 or US 2002/0134728 (Festa).

Amended claims 1 and 28, which recite that the biofilter material is for filtering water and that the fragments of coconut mesocarp consist in a mixture of parenchyma bound-up to mesocarp fibers, are believed to overcome that rejection.

First, the applicant brings the Examiner's attention to the fact that the parenchyma and the mesocarp fibers are two distinct elements which form the mesocarp and they should not be mixed-up. In this regard, the Examiner is referred to the definitions given in paragraphs [00044] to [00048] of the description.

The use of fragments of coconut mesocarp consisting in a mixture of parenchyma bound-up to mesocarp fibers as a material for biofiltering a liquid presents the following advantages which are described in paragraphs [00068] to [00077] of the description.

- *"The high lignin content of the fibers and parenchyma, in a lower concentration, ensures a superior stability when compared to the stability obtained with peat or with most other porous biological materials. Moreover, the particles of parenchyma bound-up to fibers are less friable given the high level of cohesion observed in natural coconut shells.*

- *Particles of parenchyma bound-up to fibers possess lower densities than that of peat and are approximately twice as compressible. The coconut can reach a compaction factor of the order of four, as opposed to a maximum of two for peat.*

- *The resiliency and stability of fiber and parenchyma particles, resulting from their high lignin content and from the physical structure of the two components, explains in part the high level of resistance to observable compaction. Indeed, a filtration bed made of peat of a thickness of 80 cm has a level of compaction of 20% after a few months of operation, while a filtration bed made of fiber and parenchyma particles only shows a slight compaction, mostly attributed to a rearrangement of the particles under the influence of water.*

- *The parenchymous tissue, owing to its reserve role, presents an alveolar or cavity-type structure which gives it, once dried, a great capability for retaining capillary or static water...."*

As mentioned above, one drawback with the use of peat for filtering water is its poor resiliency. Indeed, due to the fact that peat rapidly packs in tight under the weight of water and that it does not regain its shape thereafter because of its poor resiliency, it must be changed frequently with new peat.

Thanks to the fact that parenchyma is used in tight combination with the mesocarp fibers, the biofiltering material according to the invention as defined in amended claims 1 and 28 presents an excellent resiliency and, as such, does not have to be frequently changed.

Moreover, the parenchyma, inasmuch as it provides an alveolar or cavity-type structure which gives it, once dried, a great capability for retaining static

water, provides a synergetic effect in combination with the mesocarp fiber. In this regard, it is worth mentioning that the surprising good results obtained when particles of parenchyma bound-up to mesocarp fibers are used for filtering water are not attained when the parenchyma and the mesocarp fibers are used separately. Indeed, the parenchyma used alone without the mesocarp fibers shows a good resilience but the degree of filtration is limited by the size of parenchyma particles (maximum of 3 mm). On its side, the mesocarp fibers used alone without the parenchyma show less resilience than parenchyma but practically no filtration capacity (poor retaining of static water).

The improved resiliency of the fiber and parenchyma particles according to the invention is also due to the fact that these particles are obtained by cutting the raw material (mesocarp or husk) into smaller particles. Therefore, contrary to peat which naturally occurs in the form of particles and, as such, is not cut into particles, it is possible to easily control the grain size distribution of the fiber and parenchyma final particles. Such freedom of choice is not possible with peat or parenchyma used alone. The control of the grain size distribution of the final product thus allows a better control of the filtration process.

Comments on the prior art documents cited

None of Simpson, DE 4415963 or Festa discloses or teaches the use of fragments of mesocarp consisting of parenchyma bound-up to mesocarp fibers. All these documents rather only disclose the use of mesocarp fibers. Moreover, they do not disclose the use of fragments.

Simpson discloses the use of a fibrous mat such as mesocarp (col 2, line 64) or mesocarp fibrous matting (col. 5 line 12) as a supporting structure for the biofiltering material (exo-polysaccharide).

DE 4,415,963 discloses as a biofilter material a cover mat having an open-pore structure made of coir.

Festa also only mentions the use of coconut fibers. There is no mention or suggestion of also using the parenchyma.

For all these reasons, these documents cannot destroy the novelty of the present invention.

D) Response to the claim rejection for lack of unpatentability in view of the prior art cited

The Examiner has rejected all the claims under 35 U.S.C. 103(a) as being unpatentable over Boyd et al. in view of Kusey et al., Meerow, Pryce, Chewya et al., Stamps et al., Ismail et al. or Evans et al.; and Haridas, Toyone or German Patent 44 15 963.

However, as is expressly recognized by the Examiner, Boyd et al. discloses a biofilter having layers of peat, and does not disclose, teach or suggest in any way employing a mass of fragments of coconut mesocarp, the mesocarp consisting in a mixture of parenchyma bound-up to mesocarp fibers.

Moreover, none of the secondary or tertiary references disclose, teach or suggest the missing elements of Boyd et al.

Kusey et al. discloses a mixture of coconut coir pith (i.e., short fibers and fiber dust which are by-products of coconut husk processing). Meerow discloses use of coir pith as a substitute for peat in soilless container media for plant growth. Pryce discloses the use of coir as one of many possible substitutes for peat in a number of applications. Chewya et al. and Stamps et al. disclose the use of coir dust as a substitute for peat in the horticulture industry. Ismail et al. discloses

growing plants in a mixture of coconut coir and peat. Evans et al. discloses the use of coconut coir based substrates in the nursery and greenhouse industries. Thus, none of these references discloses, teaches or suggests in any way employing a mass of fragments of coconut mesocarp, the mesocarp consisting in a mixture of parenchyma bound-up to mesocarp fibers, as is required by all claims, as amended.

With regards to Toyone, and Harridas, and also DE 4,415,963, each is specifically directed to a biofilter material for filtering air or waste gas, and inasmuch as a filtering bed does not hydrodynamically react in the same way, whether it is subjected to a water effluent or an air or waste gas effluent, these documents are not relevant to the present invention. They cannot destroy the novelty of the present invention which is directed to the filtering of water. In fact, the movement of water in a filtering bed depends on the water characteristics, such as the density and the viscosity, that are completely different than that of air or waste gas effluent.

It is also submitted that a person in the art of water treatment facing a problem of efficiency will not be led to consult Toyone and Harridas to find a solution, as these documents concern air and waste gas treatment which do not mechanically react the same way as a liquid. In this regard, it is worth mentioning that the density of air is approximately 0.076 lbs/ft^3 (1,2 kg/m^3), whereas the density of water is approximately 62 lbs/ft^3 (1000kg/m^3). The impact of these different densities on the compression of filter bed treating water or air is very important. In a filter bed where 30% of the bed is occupied by water (water holdup of 0.3 including static and dynamic water), the density of the filtering media is increased by 18.7 lbs/ft^3 (300 kg/m^3). In comparison, in a filter bed treating air having an equivalent air holdup of 0.3 (static and dynamic air), the increase of the filtering media density is only 0.22 lbs/ft^3 (3,6 kg/m^3). There is therefore a world of

difference between the filtration of water and the filtration of air or gas, and as such, the applicant respectfully submits that a person in the art of water treatment, without any ingenuity and having knowledge of a document disclosing a filter designed to filter a gas effluent such as air, would not be led easily or would not think of looking at such document to find a solution for the treatment of water. To do so, it takes ingenuity. The invention defined in amended claims 1 and 28 is therefore non obvious in view of the prior art cited.

All the remaining claims ultimately depend on independent claims 1 and 28 and, as such, are also new and inventive.

For the foregoing reasons, the applicant respectfully submits that all pending claims, namely Claims 1, 5-10, 14-28, 30 and 31, are patentable over the references of record, and earnestly solicits allowance of the same.

Respectfully submitted,

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Amendments to the Drawings:

No amendments are made to the Drawings herein.